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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,326	02/12/2004	Markus Lutz	207.009-US	4922

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EXAMINER

BLUM, DAVID S

ART UNIT PAPER NUMBER

2813

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/777,326

Applicant(s)

LUTZ ET AL.

Examiner

David S. Blum

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/28/04, 3/17/05</u> | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2813

This action is in response to the election and amendment filed 8/2/05.

DETAILED ACTION

1. Applicant's election without traverse of claims 9-22 in the reply filed on 8/2/05 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 9-10 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Bosch (WO 01/77009).

Bosch teaches the device of claims 9-10 and 13-15 as follows.

Regarding claim 9, Bosch teaches a substrate (1), a mechanical structure disposed over the substrate wherein a portion of the mechanical structure is disposed in a chamber (figure 3), a periphery area disposed over the substrate including a plurality of gaps (figure 3) and a thin film encapsulation structure disposed over the mechanical structure and the periphery area, to partially define the chamber (page 5 lines 17-20).

Regarding claim 10, the thin film encapsulation film includes first and second encapsulation layers (page 5 lines 17-20).

Art Unit: 2813

Regarding claim 13, the mechanical structure includes a plurality of fixed electrodes and a plurality of gaps (functional layer 10 used as a contact for example an upper electrode and structured to produce trenches 9, thus a plurality of electrodes and trenches).

Regarding claim 14, the device includes a plurality of anchor regions, wherein the anchor regions include a plurality of gaps (layer 5, contact holes 22, trenches 7).

Regarding claim 15, the mechanical structure includes at least one fixed electrode (10), an anchor region layer 5) at least one moveable electrode (6 in layer 5) that is in physical contact to the anchor region and adjacent the fixed electrode, and the fixed electrode and the anchor region include a plurality of gaps (figure 3). Bosch teaches the device to include a diaphragm (page 3 line 7) thus the device is a resonator.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2813

5. Claims 11 and 12 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch (WO 01/77009) in view of Vossen (Thin Film Processes, pages 309-311).

Bosch teaches the device of claims 11 and 12 as recited above in regard to claim 10, and claims 23-26, except for specifically citing polysilicon silicon, porous polycrystalline silicon, amorphous silicon, silicon carbide, silicon nitride, silicon/germanium, germanium, or gallium arsenide as the first or second encapsulation layer.

Regarding claim 11, Bosch teaches the first sealing (encapsulation) layer to be of dielectric material (page 5 lines 17-20) and gives as an example, silica. The example is not limiting, the teaching is dielectric. Vossen (pages 309-311) teaches common dielectrics to include silicon, silicon carbide, silicon nitride, silicon/germanium, germanium, or gallium arsenide.

Regarding claim 12, Bosch teaches the second sealing (encapsulation) layer to be of dielectric material (page 5 lines 17-20) and gives as an example, silica. The example is not limiting, the teaching is dielectric. Vossen (pages 309-311) teaches common dielectrics to include silicon, silicon carbide, silicon nitride, silicon/germanium, germanium, or gallium arsenide.

Art Unit: 2813

Regarding claim 23, Bosch teaches a substrate (1), a mechanical structure disposed over the substrate wherein a portion of the mechanical structure is disposed in a chamber (figure 3), a periphery area disposed over the substrate including a plurality of gaps (figure 3) and a thin film encapsulation structure disposed over the mechanical structure and the periphery area, to partially define the chamber (page 5 lines 17-20). Bosch teaches the first and second sealing (encapsulation) layer to be of dielectric material (page 5 lines 17-20) and gives as an example, silica. The example is not limiting, the teaching is dielectric. Vossen (pages 309-311) teaches common dielectrics to include silicon, silicon carbide, silicon nitride, silicon/germanium, germanium, or gallium arsenide.

Regarding claim 24, the mechanical structure includes a plurality of fixed electrodes and a plurality of gaps (functional layer 10 used as a contact for example an upper electrode and structured to produce trenches 9, thus a plurality of electrodes and trenches).

Regarding claim 25, the device includes a plurality of anchor regions, wherein the anchor regions include a plurality of gaps (layer 5, contact holes 22, trenches 7).

Regarding claim 26, the mechanical structure includes at least one fixed electrode (10), an anchor region layer 5) at least one moveable electrode (6 in layer 5) that is in physical contact to the anchor region and adjacent the fixed electrode, and the fixed

Art Unit: 2813

electrode and the anchor region include a plurality of gaps (figure 3). Bosch teaches the device to include a diaphragm (page 3 line 7) thus the device is a resonator.

It would be obvious to one skilled in the requisite art at the time of the invention to modify Bosch to include common dielectrics as taught by Vossen as the dielectrics to be used. One skilled in the requisite art would use common materials to avoid time and expense of research to develop new materials when existing materials serve the necessary function.

6. Claims 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch (WO 01/77009) in view of the admitted prior art (pages 1-2).

Bosch teaches the device of claims 16-22, except for the use of a gettering layer.

Regarding claim 16, Bosch teaches a substrate (1), a mechanical structure disposed over the substrate wherein a portion of the mechanical structure is disposed in a chamber (figure 3), a periphery area disposed over the substrate including a plurality of gaps (figure 3) and a thin film encapsulation structure disposed over the mechanical structure and the periphery area, to partially define the chamber (page 5 lines 17-20). The structure includes moveable and fixed electrodes. Regarding the getter area, the admitted prior art (page 1-2) teaches MEMS typically including resonators, typically include moveable electrodes, fixed electrodes, anchors, periphery area and "often

Art Unit: 2813

includes a getter area to "capture" impurities, atoms, and or molecules that are outgassed from, for example, the silicon substrate, during operation."

Regarding claim 17, the getter area, (figure 1B), as described above, would then include the gaps in portions of the periphery area and the fixed electrodes.

Regarding 18, the a getter area is to "capture" impurities, atoms, and or molecules that are outgassed from, for example, the silicon substrate, during operation."

Regarding claim 19, the device of Bosch may include a diaphragm, thus a resonator.

The admitted prior art (page 1) teaches a common MEMS is a resonator.

Regarding claim 20, the thin film encapsulation film includes first and second encapsulation layers (page 5 lines 17-20).

It would be obvious to one skilled in the requisite art at the time of the invention to modify Bosch to include a getter area as taught by the admitted prior art to be typical and result in capturing impurities released by the substrate.

7. Claims 21 and 22 and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch (WO 01/77009) in view the admitted prior art and in further view of Vossen (Thin Film Processes, pages 309-311).

Bosch teaches the device of claims 21 and 22 as recited above in regard to claim 20, and the device of claims 27-30 as recited above in regard to claim 23, except for specifically citing polysilicon silicon, porous polycrystalline silicon, amorphous silicon, silicon carbide, silicon nitride, silicon/germanium, germanium, or gallium arsenide as the first or second encapsulation layer.

Regarding claim 21, Bosch teaches the first sealing (encapsulation) layer to be of dielectric material (page 5 lines 17-20) and gives as an example, silica. The example is not limiting, the teaching is dielectric. Vossen (pages 309-311) teaches common dielectrics to include silicon, silicon carbide, silicon nitride, silicon/germanium, germanium, or gallium arsenide.

Regarding claim 22, Bosch teaches the second sealing (encapsulation) layer to be of dielectric material (page 5 lines 17-20) and gives as an example, silica. The example is not limiting, the teaching is dielectric. Vossen (pages 309-311) teaches common dielectrics to include silicon, silicon carbide, silicon nitride, silicon/germanium, germanium, or gallium arsenide.

Regarding claim 27, the getter area, the admitted prior art (page 1-2) teaches MEMS typically including resonators, typically include moveable electrodes, fixed electrodes, anchors, periphery area and "often includes a getter area to "capture" impurities, atoms,

Art Unit: 2813

and or molecules that are outgassed from, for example, the silicon substrate, during operation.”

Regarding claim 28, the getter area, (figure 1B), as described above, would then include the gaps in portions of the periphery area and the fixed electrodes.

Regarding 29, the a getter area is to “capture” impurities, atoms, and or molecules that are outgassed from, for example, the silicon substrate, during operation.”

Regarding claim 30, the device of Bosch may include a diaphragm, thus a resonator.

The admitted prior art (page 1) teaches a common MEMS is a resonator.

It would be obvious to one skilled in the requisite art at the time of the invention to modify Bosch and the admitted prior art to include common dielectrics as taught by Vossen as the dielectrics to be used. One skilled in the requisite art would use common materials to avoid time and expense of research to develop new materials when existing materials serve the necessary function.

Art Unit: 2813

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (571)-272-1687) and e-mail address is David.blum@USPTO.gov .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr., can be reached at (571)-272-1702. Our facsimile number all patent correspondence to be entered into an application is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David S. Blum

October 17, 2005